The Chironomid Species Collected with Light Traps at the Side of Shibayamagata Lake, Ishikawa Prefecture

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Abstract: Collection of adult midges of the family Chironomidae with a light trap were carried out by Sumita on the shore of Lake Shibayamagata, Ishikawa Prefecture, 4 times in 1998, on June 9, July 15, August 11 and September 10. The specimens were preserved in 70% ethanol, sent to Suzuki for screening of species and mounting a part of them on slides in gum-chloral medium, and were sent to Sasa for species identification. A total of 62 adult male specimens among them were examined, and were classified into 24 species belonging to 15 genera, among which 6 are described here as new species. Several among them are rare or poorly known species, and are additionally described. At least two species, *Tanytarsus oyamai* and *Polypedilum kyotoense*, which were confirmed as important allergens causing bronchial asthma, were also included in the collections.

Key words: Medical entomology, Chironomidae, new species, allergen, Lake Shibayamagata

INTRODUCTION

Shibayamagata is a lake situated in Kaga-shi, the southwestern part of Ishikawa Prefecture, Hokuriku District of Honshu, Japan, about 1.5 km apart from the coast of Japan Sea, nearly square in shape with the size of about 2 km long and 1 km wide, with a surface area of about 185 hectare and a mean depth of about 2 meters. The lake is largely surrounded by rice paddies, and the hotspring town Katayamazu is situated on its western coast which discharges sewage waters into this lake. It used to be containing brackish water, but has become fresh water lake after construction of a dike on the river mouth in 1967. This is the second report on the Chironomidae of lakes in Ishikawa Prefecture, after publication of "The Chironomid species collected on the shore of Lake Kibagata" by Sasa and Sumita (1998). In this report, the results of the studies on the chironomid specimens collected about once a month with a light trap set at the side of Kibagata, 8 times during the period from February to December 1995, and once on September 1997 were reported. A total of 24 species were collected, and a new species, *Epoicocladius kibaprimus* Sasa et Sumita, 1998, was described.

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Materials and Methods

Night collections of adult chironomid midges with a light trap were carried out by Sumita 4 times in 1998 at the side of Shibayamagata Lake, Ishikawa Prefecture, on June 9, July 15, August 11, and September 10. The specimens were sent to Suzuki, and were individually mounted on slides after the principal species were screened under a stereomicroscope, and the species identification was undertaken by Sasa. The specimens are provisionally placed in Kankyo Fukushi Kenkyusho for further comparative stuides.

Results

A Total of 62 specimens among the collections were individually mounted on slides, and were classified into 24 species of Chironomidae belonging to 14 genara. Six among them are considered as representing new species, and are described in the present report. They are named as *Cryptotendipes sibaabeus, Harnischia sibabecea, Harnischia sibacedea, Polypedilum (Tripodura) sibadeeum, Stenochironomus sibaefeus* and *Tanytarsus sibafegeus*.

Description of the adult males of the species collected and identified

1. *Chironomus fujiprimus* Sasa, 1985 (Figs. 1 a-e)

Eleven (11) males were collected on June 9, No.316:71 (#1:1), No.317:01-10(#1:1:2-4; 3:1:2, 4:1:2-7). BL 6.58-7.94 (7.38 in average of 8) ㎜, WL 2.84-3.52 (3.23) ㎜, WW/WL 0.28-0.29. Scutal stripes, postnotum and hypopygium yellowish brown, other scutal portions, scutellum, abdomen and legs slightly yellowish. Frontal tubercles (Fig. 1 a) prominent, 40 μm high, 20 μm in diameter, and 18 μm apart from each other. ER 0.25-0.31 (0.28). Antenna with 11 flagellomeres, ARR 3.63-4.18 (3.90, very high), AHR 0.53-0.67 0.58). P/H 0.98-1.16 (1.08). SO 24-42 (32), CL 24-30 (27.5). Antepronotum (Fig. 1 b) slightly separated, without lateral setae. DM 0-5 (3.0, very small), DL 16-25 (20.6), PA 8-11 (9.1), SC 22-30 (25.5). Wing bare, SQ 25-38 (9.6), RR 0.25-0.38 (0.33), VR 1.04-1.09 (1.07), R/Cu 1.10-1.15 (1.13).

Hypopygium in Fig. 1 c. Anal point (lateral view) long, narrow, with a long base and darkly pigmented. Dorsal appendage (also in Fig. 1 d) long, horn-like and smoothly curved, basal portion triangular and bearing 8 inner setae and microtrichia. Ventral appendage (also in Fig. 1 e) rather stout, bearing 36 short recurved setae on distal 1/3. Gonostylus separated from gonocoxite by a deep groove, widest at about middle and inner margin slightly concave.

Remarks. From the above characters of body coloration, structure and measurement data, these specimens are identified as *Ch. fujiprimus* Sasa, 1985, described first with specimens collected from Lake Shoji on the foot of Mount Fuji, and later also from Lake Biwa and Nojiri. It is especially characteristic in that body is largely pale yellow, frontal tubercles are large, AR is high, and DM is very small in the numbers.

2. *Chironomus kagaensis* Sasa, 1994 (Figs. 2 a-e)

Three males were collected; 1 on June 9, No.316:74 (1:4); 1 on August 11, No.316:85 (#3:2); 1 on September 10, No.316:96 (#4:2). BL 7.56, 6.52, 6.32 mm, WL 3.26, 2.80, 2.66 mm, WW/WL 0.29, 0.29, 0.27. Body almost entirely dark brown, excepting scutellum and areas between scutal stripes are yellow. Frontal tubercles (Fig. 2 a) small, 10 μm long, 11 μm wide and 10 μm apart from each other. ER 0.08, 0.19, 0.29. Antenna with 11 flagellar segments, AR 3.38, 3.00, 3.50, AHR 0.60, 0.59, 0.56. Palp short, P/H 0.84, 0.75. SO 42:42, 38:38, 42:42 (very many), CL 36, 30, 20. Antepronotum (Fig. 2 b) separated, without setae. DM 26, 27, 24, DL 34:38, 39:38, 48:40, SC 48, 43, 44 (all much larger than in the above species). SQ 34:32. 16:16, RR 0.30, 0.35, 0.32, VR 1.05, 1.05, 1.08, R/Cu 1.13, 1.14, 1.14. fLR 1.47, mLR 0.50, 0.55, hLR 0.69, fTR 0.24, fBR 2.0, mBR 2.0, hBR 2.7.

Hypopygium in Fig. 2 c. Anal point long, narrow, parallel-sided, apically rounded and bare. Dorsal appendage (also in Fig. 2 d) composed of a triangular base bearing 10 inner setae and microtrichia, and a bare distal horn abruptly hooked apically. Ventral appendage (also in Fig. 2 e) long, narrow and fingerlike, with some 20 recurved setae. Gonostylus widest at about middle, inner margin slightly concave, with 12 short setae along inner margin.

Remarks. These specimens are diagnosed as *Ch. kagaensis* Sasa, 1994, which was recorded from Yamashiro Hotspring Town in the same Ishikawa Prefecture. The structures are similar to the above species, *Ch. fujiprimus*, but body coloration is darker, AR is smaller, the numbers of DM, DL, SC are much larger, anal point is not pigmented but hyaline, distal horn of dorsal appendage is less curved but abruptly hooked apically, an ventral appendage is longer and narrower.

3. *Chironomus kiiensis* Tokunaga, 1936

Two males were collected; 1 on June 9, No.316:72 (#1:2); another on August 15, No.316:21 (#2:1). This is a species commonly recorded from rice paddies and rather oligotrophic lakes and streams in Japan.

4. *Dicrotendipes pelochloris* (Kieffer, 1912)

A male was collected on June 9. No.316:76 (#1-6). BL 5.02 mm, WL 2.16 mm, WW/WL 0.29. Scutal stripes and postnotum dark brown, other scutal areas and scutellum brown, abdominal tergites I to IV entirely yellow, V largely yellow and with a longitudinal dark band in the middle, VI to hypopygium brown; in the front leg, basal half of femur yellow, distal half dark brown, tibia entirely dark brown, tarsus I yellow for basal half and distal half gradually darkened to brown, tarsi II to V brown; in the middle and hind legs, basal 1/3 of femora yellow and distal 2/3 gradually darkened to brown, tibiae brown (middle tibia slightly paler in the middle portion), tarsi I entirely yellow, basal half of tarsi II and III yellow and gradually darkened to brown towards tip, IV and V brown.

ER 0.18. Antenna with 1 flaggellar segments, AR 2.30, AHR 0.70, P/H 1.09. SO 18:19, CL 16. DM 12, DL 8:8, PA 3:3, SC 8. SQ 14:14, RR 0.20, VR 1.10, R/Cu 1.11. fLR 1.67, mLR 0.59, hLR 0.74, fTR 0.26, fBR 2.1, mBR 2.9, hBR 3.1. Pulvilli large, brush-like.

Anal point very broad and widest at base, strongly bent downwards and appically pointed. Dorsal appendage short, finger-like and expanded distally, with 1 or 2 inner setae near apex. Ventral appendage about twice as long as the dorsal appendage, with recurved setae. Gonostylus widest at about distal 1/3, inner margin slightly concave.

Remarks. This specimen is almost coincident in the structure and measurement data to the specimens described by Sasa and Hasegawa (1983) from Okinawa, and later also by Sasa and coworkers from various localities in Japan by the name of *D. niveicaudus* (Kieffer, 1921), which is now considered as a synonym of *D. pelochloris* (Kieffer, 1912).

5. *Cryptotendipes sibaabeus* sp. nov. (Figs. 3 a-j)

Two males were collected; one on June 9, paratype, No.316:27 (#1:12); another on September 10, holotype, No.316:100 (#4:7:2). BL 3.25, 3.12 mm, WL 1.36, 1.72 mm, WW/WL 0.35, 0.35 (very wide). Scutal stripes, postnotum and hypopygium brownish yellow, other scutellar portions, scutellum, abdomen and legs yellow. Head in Fig. 3 a. Eyes bare, both with a strong dorsomedial extension, ER 0.44, 0.38. Antenna with 11 flagellar segments, AR 1.79, 2.00, AHR 0.55, 0.55. Frontal tubercles (Fig. 3 b) prominent, 20 microns long, 14 microns in diameter, and 20 microns apart from each other. SO 10:10, 10:10, CL 12, 11. Antepronotum (Fig. 3 c) united, with 1:1, 1:1 lateral seta. Distribution of setae on scutum and scutellum in Fig. 3 d; DM 8:6, DL 10:9, 10:10, PA all 3, SC 8, 4.

Wing (Fig. 3 e) bare, granular, SQ all 6. R2+3 separated but ending close to the tip of R1, RR 0.19, 0.32. VR 1.20, 1.15, R/Cu 1.12, 1.13. Tip of front tibia (Fig. 3 f) with a broad and rounded terminal scale. Tips of middle and hind tibiae (Figs. 3 g,h) with two broad comb scales, both with a spur. Tarsi all lost excepting one middle tarsi of the holotype, mLR 0.55, mBR 4.0. Pulvilli large, brush-like.

Hypopygium in Fig. 3 i. Anal point (Figs. 3 j, dorsal; k, ventral view) peculiar in the structure, relatively long, narrow and apically rounded, with a median longitudinal ridge on both dorsal and ventral side, the former with 3 pairs of lateral setae and marginal microtrichia, the latter with 5 pairs of lateral setae and entirely clothed with microtrichia. Ninth tergite with a pair of shoulder-like projection on posterior margin, and with 7 or 8 long setae flanking the base of anal point. Dorsal appendage (Fig. 3 j) small, rodlike, only slightely extended beyond posterior margin of 9th tergite, constricted near apex, with 1 or 2 preapical setae and microtrichia along inner margin. Gonostylus long and slender, inner margin smoothly concave and without projection, with 6 short marginal setae.

Remarks. These specimens are considered as belonging to the genus *Cryptotendipes* Lenz, 1941, of the *Harnischia* Complex, tribe Chironomini, since antennae are composed of 11 flagellar segments, both comb scales of middle and hind tibiae with a spur, ventral appendage is absent, dorsal appendage is small, rod-like and with a few preterminal setae, and gonostylus is long, simple and without terminal hook. This genus was reviewed by Saether (1977, p.37), who recognized 10 species from the Palaearctic and Nearctic Regions. The general structures of this genus was also reviewed by Cranston *et al.* (1989, p.371). The present specimens are most closely related to the Palaearctic species *C. pseudotener* (Goet-

ghebuer), in that ninth tergite without dorsal hump, anal point relatively long, and inner margin of gonostylus without a distinct projection, but in *C. pseudotener* anal point is long, simple and basally constricted, and gonostylus is expanded distally. Two species have been recorded from Japan as members of this genus, *C. tamacutus* Sasa, 1983 and *C. oyabeprimus* Sasa *et al.*, 1988, but both species are also remarkably different from the present specimens in the structure of anal point, dorsal appendage and gonostylus (ref. Sasa & Kikuchi, 1995, Plate 19 G,H).

6. *Harnischia sibabecea* sp. nov. (Figs. 4 a-i)

Two males were collected on August 15. No.316:24 (#2:4:2), 317:18 (#4:7:15). BL 3.44, 3.44 mm, WL 1.48, 1.42 mm, WW/WL 0.28, 0.30. Scutal stripes, postnotum and hypopygium slightly brownish yellow, other body portions slightly yellow. Head in Fig. 4 a. Eyes bare, ER 0.25, 0.26. Antenna with 11 flagellomeres, AR 2.23, AHR 0.53. P/H 1.18. SO 11-13 (12.5), CL 20, 18. Frontal tubercles absent. Antepronotum (Fig. 4 b) very narrowly united, with 3:3, 4:4 lateral setae. Scutum and scutellum in Fig. 4 c. DM 16, 16, DL 10 or 11 (10.5), Pa 3-5 (4.5), SC 12.

Wing (Fig. 4 d) bare, SQ 8:8, 5:5, R2+3 in contact with R1, VR 1.14, 1.18, R/Cu 1.13, 1.14. Tip of front tibia (Fig. 4 e) with a broad and rounded terminal scale. Tip of middle tibia (Fig. 4 f) with two broad comb scales, one with a spur and the other without spur. Tip of hind tibia (Fig. 4 g) with two very broad comb scales, both with a spur. Tarsi of front and hind legs lost, mLR 0.71, 0.66. Pulvilli large, brush-like.

Hypopygium in Figs. 4 h (dorsal) and i (ventral view). Anal point (lateral view) very stout and long, widest at base and curved ventrally, entirely bare and hyaline excepting the basal portion of dorsal side with long setae and ventral portion of the base with short setae and microtrichia. Both dorsal and ventral appendages absent, gonocoxite with a low and long swelling on basal 1/4 of inner margin. Gonostylus long and narrow, nearly straight, with 20 short setae along inner margin.

Remarks. These specimens belongs to the genus *Harnischia* Kieffer, 1921, since the bacic structures are the tribe Chirnomini, but both dorsal and ventral appendages of gonocoxite are absent. It has a stout and bare anal point, which is not found in the previously recorded species of this group. Terminal comb scales of middle tibia have one spur, but that on hind tibia with two spurs, which are also an unusual structure of this species.

7. *Harnischia sibacedea* sp. nov. (Figs. 8 a-k)

Five males were collected. No.317:13-17 (#4:7:10-14). Holotype: No.317:15. Paratypes: other 4 males. BL 2.86-3.54 (3.44 in average of 5) mm, WL 1.28−1.42 (1.35) mm, WW/WL 0.34-0.35. Scutal stripes and postnotum brownish yellow, other thorax portions, abdomen and legs pale yellow. Head in Fig. 8 a. ER 0.39-0.52 (0.47). Antenna with 11 flagellomeres, AR 2.00-2.21 (2.07). P/H 0.96-1.11 (1.03). SO 8-10 (9.2), CL 12-14 (13.4). Frontal tubercles (Fig. 8 b) prominent, widest at about middle, 22 μm long, 14 μm wide and 24 μm apart from each other in the holotype. Antepronotum (Fig. 8 c) wiely sepaprated, with 0-2 (mean 1.8) lateral

setae. Setae on scutum and scutellum in Fig. 8 d. DM 4-8 (6.2), DL 9-11 (9.9), PA all 3, SC 4-6 (4.8).

Wing (Fig. 8 e) bare, very wide (WW/WL 0.34-0.35), SQ 6-12 (7.3), RR 0.21-0.33 (0.28), VR 1.10-1.19 (1.06), R/Cu 1.09-1.12 (1.11). Front tibia with a long and rounded terminal scale bearing 2 or 3 long setae (Fig. 8 f). Tips of middle and hind tibiae (Figs. 8 g,h) with two comb scales, both with a short spur. Front tarsi all lost, mLR 0.54-0.57 (0.56), hLR 0.65-0.66, mBR 3.2, hBR 3.6-3.7. Tarsi V all very wide, with an empodium, two claws and a pair of large brush-like pulvilli (Fig. 8 i).

Hypopygium in Figs. 8 j (dorsal view) and 8 k (ventral view of anal point and inner margin of gonocoxite). Anal point stout, slightly expanded distally, with lateral ridges and 5 pairs of short lateral setae on both dorsal and ventral sides. Ninth tergite with nearly flat posterior margin, with 3 pairs of long setae near the base of anal point and with 3 pairs of long setae on shoulder portion. Both dorsal and ventral appendages absent. Gonostylus long, slender, smoothly curved inwards and apically rounded, with 4 pairs of long setae on inner margin near the base, and 8 pairs of short setae along distal half of inner margin.

Remarks. This species belongs also to the genus *Harnischia,* especially in veiw of the peculiar structure of hypopygium, but differs from the above species at least in that prominent frontal tubercles are present, antepronotum is widely separated and with only 0, 1 or 2 lateral setae, anal point is hyaline, slightly expanded distally and with short lateral setae in the middle portion, posterior margin of ninth tergite is nearly flat, and gonostylus is conspicuously curved inwards. It is also closely related to *H. okilurida* Sasa, 1993 among the previously recorded species, in that body is almost entirely pale yellow, both dorsal and ventral appendages and absent, anal point is constricted in the middle and with short lateral setae, but *H. okilurida* differs from the present species at least in that frontal tubercles are small, antepronotum united in the middle and with 8 lateral setae (widely separated and with only 0-2 lateral setae in the present species), posterior margin of ninth tergite is produced in the middle and without long setae, and gonostylus is stout and nearly straight.

8. *Microchironomus tener* (Kieffer, 1918) (Figs. 5 a-i)

A male was collected on August 11; No.316:94 (#3:12). Small midge, BL 2.35 mm, WL 0.98 mm, wing very wide, WW/WL 0.37. Head in Fig. 5 a. Frontal tubercles absent. Eyes bare, ER 0.27. Antenna with 11 flagellomeres, AR 1.45, AHR 0.55. Palp short, P/H 0.86. SO 6:6, CL 9. Antepronotum (Fig. 5 b) united, with 2:3 lateral setae. Scutum and scutellum in Fig. 5 c; DM 5, DL 10:10, PA 3:4, SC 4. Wing (Fig. 5 d) bare, SQ 5:5, RR 0.43, VR 1.24, R/Cu 1.10. Tip of front tibia (Fig. 5 e) with a broad and rounded terminal scale, tips of middle and hind tibiae (Figs. 5 f,g) with two terminal comb scales, both with a short spur. Tarsi all lost.

Hypopygium in Fig. 5 h. Anal point (also in Fig. 5 i, ventral view) long, widest at base and distal 2/3 parallel-sided, with rounded apex, with microtrichia on basal 1/3, distal 2/3 bare, and with lateral and ventral setae on basal 1/3. Ninth tergite with a pair of small and rounded process on posterior margin flanking anal point, bearing 3 or 4 setae and

microtrichia (Fig. 5 i). Dorsal appendage rod-like, 65 μm long and 12 μm wide, widest at about distal 1/3, with one apical and 2 preapical setae. Ventral appendage absent. Gonostylus fused with gonocoxite, inner margin expanded basally and with an apical hook.

Remarks. This specimen belongs to the genus *Microchironomus* Kieffer, 1918, of the *Harnischia* complex of tribe Chironomini, since antenna with 11 flagellomeres, antepronotum united and with lateral setae, ninth tergite with a pair of rounded processes flanking long anal point, dorsal appendage rod-like and bearing apical and subapical setae, ventral appendage is absent, and gonostylus expanded basally and with an apical tooth. The above structure, measuremet data and body coloration is almost coincident with the species recorded by Sasa and Kawai (1987) by the name of *M. tener* (Kieffer, 1918) from Lake Biwa, middle Honshu.

9. *Pentapedilum sordens* (van der Wulp, 1874)

Two males were collected, 1 on August 11, No.316:87 (#3:6); another on September 10, No.316:97 (#4:5). this is a species originally recorded from Europe, and also from 5 localities in Japan (Sasa & Kikuchi, 1995, p. 35).

10. *Polypedilum (Polypedilum) arundineti* Goetghebuer, 1921

A male was collected on June 9, No.316:79 (#1:9). This is also a species originally recorded from Europe, and also from 5 localities in Japan (Sasa & Kikuchi, 1995, p.37).

11. *Polypedilum (Polypedilum) kyotoense* (Tokunaga, 1938)

Two males were collected on June 9. No.316:81, 82 (#1:11:1, 2). This is a common species emerging from rice paddies in Japan, and was found to be an important allergen causing bronchial asthma (Sasa, 1985).

12. *Polypedilum (Polypedilum) nubifer* (Skuse, 1889)

A male was collected on August 11, No.316:86 (#3:3). This is a species with cosmopolitan distribution, and has been also recorded commonly from Japan, as reviewed by Sasa and Sublette (1988).

13. *Polypedilum (Tripodura) japonicum* (Tokunaga, 1938)

Two males were collected on September 10. No.317:11, 12 (#4:6:2, 3). This is a species originally recorded from Kyoto, Japan, and has been collected commonly in rice paddy areas in Japan.

14. *Polypedilum (Tripodura) sibadeeum* sp. nov. (Figs. 6 a-j)

Four males were collected, 1 on June 9, No.316:80 (#1:10); 2 on August 11 No. 316:88, 93 (#3:7, 10); 1 on September 10, No.316:98 (#4:6). Holotype: No.316:98. Paratypes: other 3 spepcimens. BL 3.33-3.68 (3.55 in average of 4) mm, WL 1.64-1.84 (1.70) mm, WW/WL 0.32-0.33. Head in Fig. 6 a. ER 0.11-0.22 (0.16). Antenna all lost excepting one on the holotype, in which it has 13 flagellar segments, AR 1.26, AHR 0.56. P/H 1.03-1.11 (1.07), SO

10-12 (10.8), CL 17-22 (18.8). Antepronotum (Fig. 6 b) separated, without seta, inner process of basal portion darkly pigmented. Distribution of setae on scutum and scutellum in Fig. 6 c; DM 12-22 (16.0), DL 16-20 (17.4), PA 4-6 (4.5), SC 16-20 (17.5). Frontal tubercles absent.

Wing (Fig. 6 d) bare, with two faint transversal cloudy marks in the middle and distal portion. Squama with 10-12 (10.4) fringe hairs, RR 0.16-0.28 (0.22), VR 1.22-1.25 (1.23), R/Cu 1.12-1.15 (1.14). tip of front tibia (Fig. 6 e) with a broad and rounded scale, tips of middle and hind tibiae (Figs. 6 f,g) with two comb scales, one with a long spur and the other without spur. Tarsi all lost excepting that on the midleg of a paratype No. 316:80, in which mLR 0.66, mBR 4.6. in No.316:80. Pulvilli large, brush-like.

Hypopygium in Fig. 6 h. Anal point long and narrow, ninth tergite without a pair of processes on posterior margin, and with some 14 long setae in the middle portion, and some 10 short setae near the base of anal point. Dorsal appendage (also in Fig. 6 i, paratype No.316:93) pad-like, distally expanded and inner margin concave, with 2, 3 or 4 long setae on posterior margin, and entirely clothed with microtrichia. Ventral appendage (also in Fig. 6 j) long, finger-like, with 18-20 short recurved setae and a long apical seta. Gonostylus long, narrow, widest at about basal 1/4, with 12 setae on inner margin.

Remarks. These specimens are typical in the structures of head, wings and hypopygium to the genus *Polypedilum*, and belongs to the subgenus *Tripodura* Townes, 1945, in that dorsal appendage is broad, pad-like and entirely clothed with microtrichia, but is unusual as a member of it in that ninth tergite without a pair of processes flanking anal point. They are also characteristic in that wing with two transversal cloudy marks. Therefore, they are somewhat related to *P. udominutum* Niitsuma, 1992, but this species is much smaller in body size (WL 0.9-1.2 mm), AR much smaller (0.23-0.28), and the numbers of DL and SC are much smaller (8-11 and 2, respectively).

15. *Stenochironomus sibaefeus* sp. nov. (Figs. 7 a-k)

A male was collected on July 15. Holotype: No.316:22 (#2:2). BL 5.24 mm tip of wings both broken off, WL presumably 2.20 mm, WW/WL 0.27. Scutum with two small dark brown marks in the middle portion of lateral stripes (Fig. 7 c), other scutellar portions, scutellum, abdomen and legs almost entirely pale, anal point dark brown and other hypopygium portions pale, front tibia brownish. Head in Fig. 7 a. Eyes bare, ER 0.40. Antenna with 13 flagellomeres, AR 2.13. P/H 1.14. SO 18:18, CL 22. Frontal tubercles absent. Antepronotum (Fig. 7 b) separated, without setae. Scutum and scutellum in Fig. 7 c; DM 20. DL 24:24, PA 6:6, SC 26.

Wing in Fig. 7 d. Squama fringed, R2+3 in contact with R1, VR 1.13. Tip of front tibia (Fig. 7 e) with a long and rounded terminal scale bearing 2 long setae and 1 short and curved seta. Terminal comb scales of middle and hind tibiae (Figs. 7 f,g) contiguous, with two short spurs. Front and middle tarsi lost, hLR 0.61, hBR 0.51. Pulvilli well developepd, brush-like.

Hypopygium in Fig. 7 h. Anal point (also in Fig. 7 i) long, narrow and constricted at about middle, with a V-shaped base, bare and darkly pigmented. Ninth tergite with rounded

posterior margin, bearing long setae in the middle near the base of anal point, and shorter setae on posterior margin flanking anal point, a part of which are stout and lamellar (Fig. 7 i). Dorsal appendage (also in Fig. 7 j) small, composed of a triangular base clothed with microtrichia, and a bare distal triangular horn. Ventral appendage (also in Fig. 7 k) very long and smoothly curved, with a strong apical spur and 3 long preapical setae. Gonostylus also long and slender, nearly parallel-sided and apically rounded, with 3 long preapical setae and 12 short setae on inner margin.

Remarks. This specimen is considered as belonging to the genus *Stenochironomus* Kieffer, 1919, since antenna with 13 flagellomeres, antepronotum strongly reduced towards middle, wings are bare, front tibia with a rounded terminal scale, terminal combs of middle and hind tibiae fused and with two spurs, pulvilli well developed, anal point is long and narrow, dorsal appendage small, ventral appendage extremely long and with a strong apical spur. This specimen is somewhat related among the European species to *S. fascipennis* (Zetterstedt), in that ventral appendage without lateral setae and ninth tergite with lamellar setae on posterior margin flanking anal point (after Pinder, 1978, p.140), but this species has no distinct markings on thorax (Edwards, 1928, p.395). Nine species were recorded from Japan as of 1995 as members of this genus, among which the present specimen is most closely related to *S. membranifer* Yamamoto, 1981, in that scutum with 2 dark spots and wings without dark marks, but in *S. membranifer* abdominal tergites Ⅵ to hypopygium are dark brown (abdomen entirely yellow in the present species), setae in the middle portion of ninth tergite are longer and extending much beyond posterior margin, and setae on posterior margin flanking anal point are all short and simple but not lamellar.

16. *Tanytarsus oyamai* Sasa, 1979

Two males were collected on June 9. No.316:83, 84 (#1:13, 14). This is a common species widely distributed in Japan, and has been noted as an important allergen causing bronchial asthma (Sasa, 1985).

17. *Tanytarsus shoudigitatus* Sasa, 1989

Twelve males were identified as slide-mounted specimens. No.316:89, 90,91, 99 (#3:8:1, 2, 3:9:2. 4:7:1), No. 317:21-28 (#4:7:2-9). BL 2.76-3.08 (2.88 in average of 8) ㎜, WL 1.42-1.57 (1.48) ㎜, WW/WL 0.28-0.30 (0.29). AR 1.03-1.13 (1.08), ER 0.71-0.84 (0.77), SO 8-10 (9.7), CL 6-14 (8.4), PA all 1, DM 9-12 (11.4), DM 7-10 (8.4), PA all 1, SC 4-6 (5.0), SQ all 0, RR 0.38-0.45 (0.41), VR 1.25-1.30 (1.27), R/Cu 1.09-1.13 (1.11). The structures of hypopygium and other body portions as described in the original paper by Sasa (1989, p.40).

18. *Tanytarsus sibafegeus* sp. nov. (Figs. 9 a-k)

A male was collected on July 16. Holotype: No.316:23 (#2:5:1). BL 3.10 ㎜, WL 1.48 ㎜, WW/WL 0.30. Body almost entirely white, scutal stripes and postnotum slightly yellowish. Head in Fig. 9 a. ER 0.55, AR 0.07, AHR 0.52. SO 10:10, CL 14. Palp both lost from the 4th segment. Frontal tubercles (Fig. 9 b) very large, 20 ㎛ high, 12 ㎛ wide at the base,

and 40 μm apart from each other. Antepronotum (Fig. 9 c) separated, without lateral seta. Bases of setae on scutum and scutellum in Fig. 9 d; DM 8, DL 8:8, PA 1:1, SC 4. Wing (Fig. 9 e) bare, SQ 0:0, RR 0.46, VR 1.23, R/Cu 1.08. Tip of front tibia (Fig. 9 f) with a narrow and apically pointed process, tip of middle and hind tibiae (Figs. 9 g,h) with two comb scales, both with a spur. Tarsi of front and middle legs all lost. hLR 0.72.

Hypopygium in Fig. 9 i. Anal point widest at base and apically rounded, with lateral ridges, and with 6 spine clusters, but without lateral setae and without microtrichia. Median appendage (also in Fig. 9 j) short, with inwards directed simple setae. Dorsal appendage (also in Fig. 9 k) roughly oval, inner margin slightly concave, with 2 inner, 2 dorsal and 4 lateral setae. Digitus absent. Ventral appendage finger-like, with 10 recurved setae on dorsal side and 4 caudally directed setae on ventral side of apical portion. Gonostylus widest at about middle, tapering towards pointed apex, with 6 short setae along inner margin. Ninth tergite without long setae on dorsal side, bands of ninth tergite separated.

Remarks. This specimen is structurally a typical member of the genus *Tanytarsus*, and belongs to the *oyamai* group, since anal point with lateral ridges and spine clusters, dorsal appendage is elongate oval, digitus is absent, and median appendage is short, with inwards directed short setae. It is therefore somewhat related in structure to *T. gregarius* Kieffer, especially in that digitus is absent and dorsal appendage is elongate oval, but in *T. gregarius* long axis of dorsal appendage is parallel with the body axis (directed inwards in the present spepcies) and median appendage much longer (cf; Pinder, Fig. 186D). It is also related among the Japanese species of this genus to *T. miyakoflavus* Sasa et Hasegawa, 1988, in that body is largely yellow, dorsal appendage is oval and without digitus, but in *T. miyakoflavus* some setae on median appendage are conspicuously foliate, long axis of dorsal appendage is parallel to body axis, and ventral appendage is much stouter.

19. *Tanytarsus takahashii* Kawai et Sasa, 1985

A male was collected on August 11. No.316:92 (#3:9:2). This species was originally described from Ohta River, Hiroshima, and this is the 5th record from Japan.

20. *Psectrocladius yunoquartus* Sasa, 1984

A male was collected on June 9. No.316:78 (#1:8). This is a species recorded commonly from lakes in Japan.

21. *Limnophyes minimus* (Meigen, 1818)

Two males were collected on June 9; No. 316:25, 26 (#1:15, 16). This is a common species with a world wide distribution, and has been recorded at least from 12 localities in Japan before 1994 (Sasa & Kikuchi, 1995, p.67).

22. *Nikismittia hibarabifurca* Sasa, 1993

A male was collected on August 11. No.316:95 (#3:13). BL 1.72 mm, WL 0.90 mm, WW/WL 0.32. Body almost entirely dark brown. ER 1.53, antenna with 13 flagellar seg-

ments, AR 0.92, AHR 0.43. Last two segments of palpi both lost. SO 2:2, CL 4. Antepronotum separated, with 1:1 lateral seta. Scutum with a median pale hole with 2 minute setae. DL 8:8, PA 4:3, SC 4. Squama bare, RR 0.68, VR 1.20, R/Cu 0.89. fLR 0.39 (unusually small), mLR 0.47, hLR 0.53, fTR 0.13, fBR 2.2, mBR 2.4, hbR 4.6. .Pulvilli vestigial.

Anal point small, very low and long, almost rectangular with the highest point in the middle, darkly pigmented and situated in the middle portion of ninth tergites, with a seta on the highest point. Inner lobe of gonocoxite very large and almost rectangular. Gonostylus bifurcate at about middle like figure V, the ventral arm about 2/3 the length of dorsal arm, both arms with 2 or 3 short preapical setae but without megaseta.

Remarks. This species was recorded with a specimen collected at the side of Lake Hibara, in the mountain area of Fukushima Prefecture, and this is the second record. The present speimen is much smaller in the body size (WL 1.56 mm), but other measurement data and structures are nearly the same.

23. *Procladius sagittalis* Kieffer, 1909

A male was collected on June 9. No.316:77 (#1:7). This species was originally recorded from Europe, and also from Japan, by Tokunaga (1937) from Kyoto and Mie, and by Sasa (1988, 1991, 1993) from northern Japan, i.e. Hokkaido, Aomori and Fukushima.

24. *Psectrotanypus yoshimurai* (Tokunaga, 1937)

A male was collected on June 9. No.316:73 (#1:3). This species was originally recorded from Kyoto, and later by Sasa and Okazawa (1991) from Toyama, and by Sasa and Suzuki (1991) from Kumamoto.

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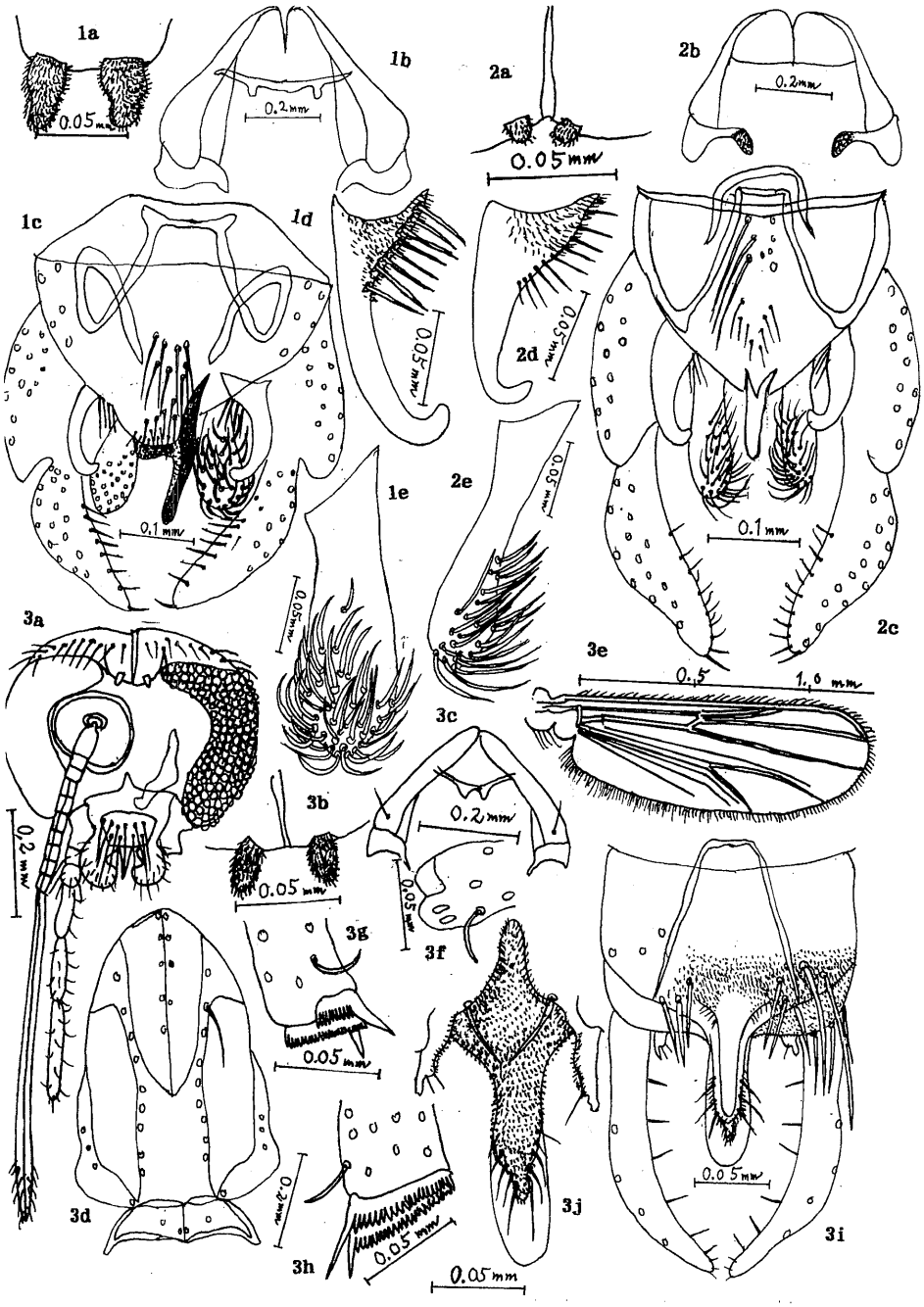

Plate 1. Fig. 1. *Chronomus fujiprimus* Sasa, 1985 a-e
Fig. 2. *Chronomus kagaensis* Sasa, 1995 a-e
Fig. 3. *Cryptotendipes sibaabeus* sp. nov. a-j

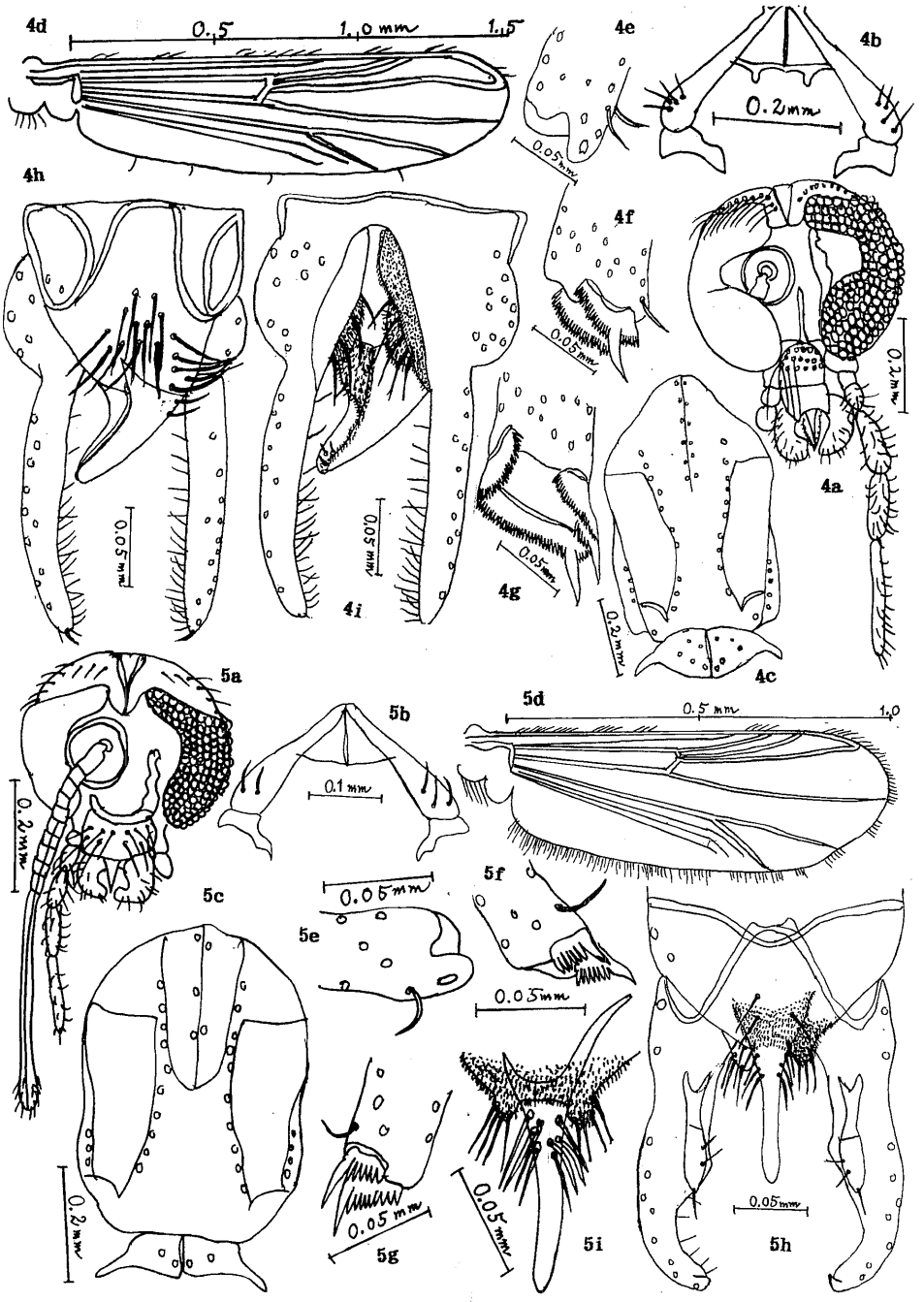

Plate 2. Fig. 4. *Harnischia sibabecea* sp. nov. a-i
Fig. 5. *Microchironomus tener* (Kieffer, 1918) a-i

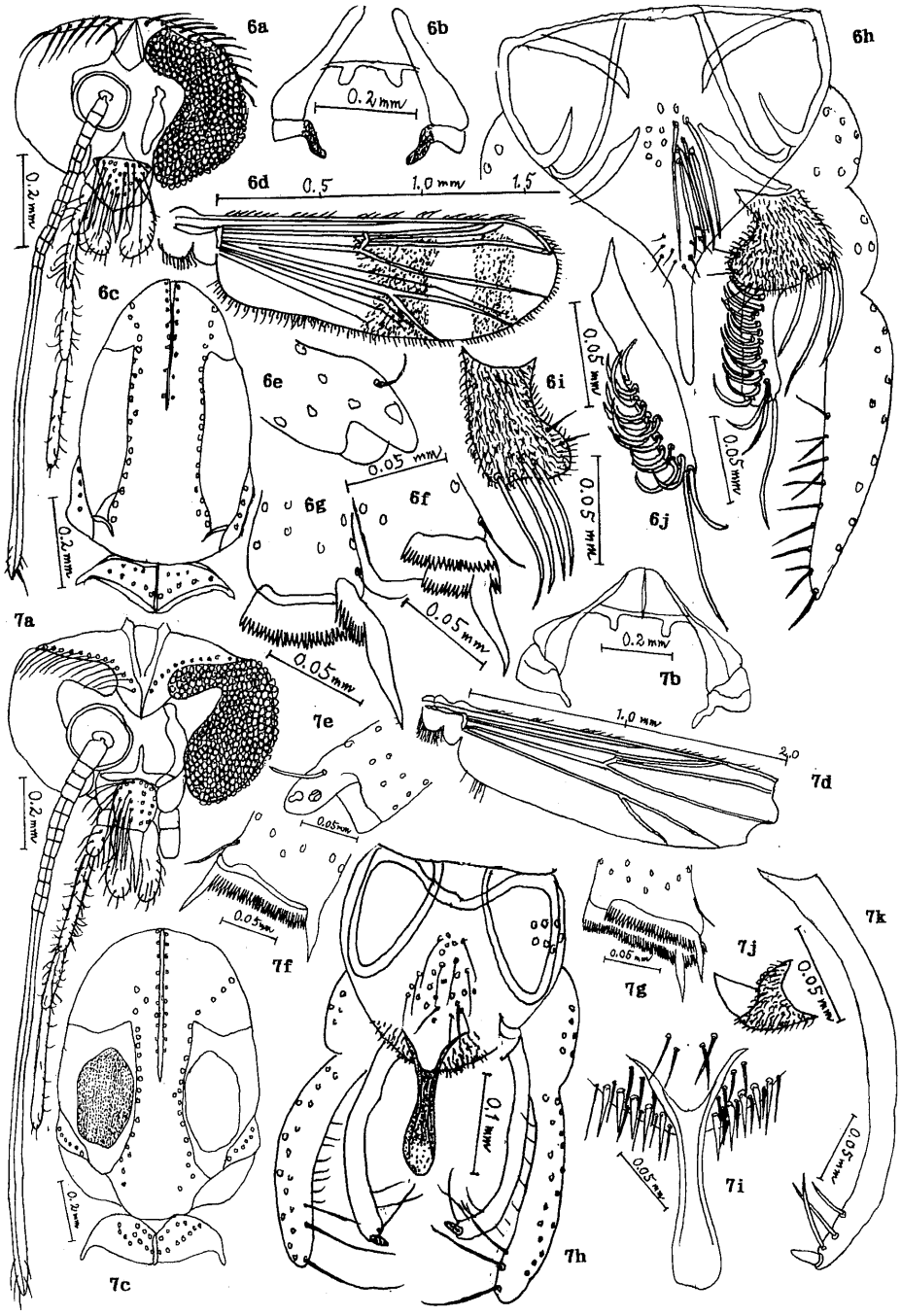

Plate 3. Fig. 6. *Polypedilum (Tripodura) sibadeeum* sp. nov. a-j
Fig. 7. *Stenochironomus sibaefeus* sp. nov. a-k

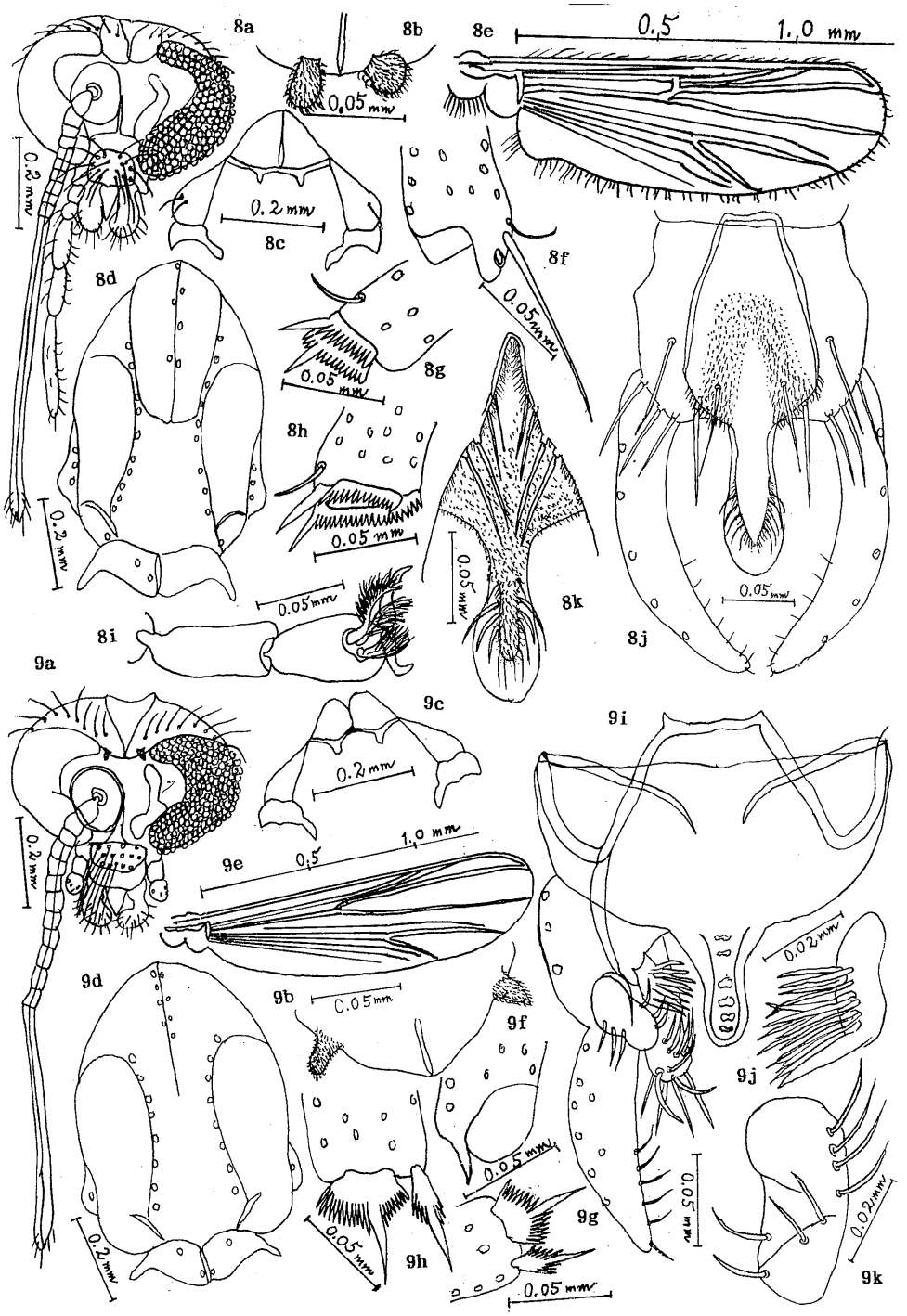

Plate 4. Fig. 8. *Harnischia sibacedea* sp. nov. a-k
Fig. 9. *Tanytarsus sibafegeus* sp. nov. a-k